

Technical Report 459

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# DESIGN AND DEVELOPMENT OF THE LEARNING ACTIVITIES QUESTIONNAIRE

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completed high school. In 10 of the 15 major comparisons conducted, graduate students used each of the learning strategies significantly more than the other groups. With the exception of rote methods, the three non-college groups of Army trainees reported the lowest use of learning strategies. In general, rote strategies appeared to be used frequently by all groups of respondents for most tasks. However, graduate students supplemented rote strategies with additional learning strategies. This was also true, although to a lesser extent, for community college students. It appears that learners at lower educational levels may not have developed a broad repertoire of learning strategies and depend, to a large degree, on rote strategies. This suggests the need for training programs designed to modify or enhance the learning strategies of students and trainees, particularly at lower educational levels.

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## FOREWORD

The Personnel and Training Research Laboratory of the Army Research Institute for the Behavioral and Social Sciences (ARI) conducts research to support training methods to optimize skill acquisition and retention. A variety of research is being conducted on the effects of various learning strategies on skill acquisition and retention. ARI, in cooperation with the Defense Advanced Research Projects Agency (DARPA), is especially interested in training that improves the trainee's ability to learn.

This report is one of a series on the development of the Cognitive Learning Strategies Training Program. This report outlines the design and development of the Learning Activities Questionnaire. Research was conducted at the University of Texas at Austin with the assistance of Ann C. Schulte under contract DAHC19-76-C-0026, monitored by Joseph S. Ward of ARI under Army Project 2Q161102B74F, and funded by DARPA.

  
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## DESIGN AND DEVELOPMENT OF THE LEARNING ACTIVITIES QUESTIONNAIRE

### BRIEF

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#### Requirement:

To design an instrument which could be used to identify types of learning strategies used by individuals in a variety of academic and training environments.

#### Procedure:

An exploratory study was conducted with college students to determine the types of strategies used by effective learners. The results from these semi-structured interviews were used to construct the Learning Activities Questionnaire (LAQ) so that additional data could be collected from large groups of individuals at different educational levels. After undergoing two pilot tests, the final version of the LAQ was administered to individuals at five different educational levels: graduate students, community college students, and three groups of Army trainees--high school graduates, general equivalency diploma holders and trainees who had not completed high school.

#### Findings:

In 10 of the 15 major comparisons conducted, graduate students used each of the learning strategies significantly more than the other groups. With the exception of rote methods, the three non-college groups of Army trainees reported the lowest use of learning strategies. In general, rote strategies appeared to be used frequently by all groups of respondents for most tasks. However, graduate students supplemented rote strategies with additional learning strategies. This was also true, although to a lesser extent, for community college students. It appears that learners at lower educational levels may not have developed a broad repertoire of learning strategies and depend, to a large degree, on rote strategies.

#### Utilization of Findings:

This report documents the development of an instrument which can be used to identify learning strategies used by individuals in various educational and training settings.

The results obtained from using the LAQ could be used to provide individual learning prescriptions for students.

The findings obtained from using this instrument with various groups of learners suggest the need for training programs designed to enhance the learning strategies of students and trainees, particularly at lower educational levels.



# DESIGN AND DEVELOPMENT OF THE LEARNING ACTIVITIES QUESTIONNAIRE

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DESIGN AND DEVELOPMENT OF THE LEARNING  
ACTIVITIES QUESTIONNAIRE

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Introduction

In the past few years, learning theorists have been re-examining the role of the learner in the learning process (Melton & Martin, 1972; Rigney, Note 1; Weinstein, 1978). Previous research had centered upon varying stimulus materials and environmental conditions and assessing the effects upon learning outcomes, without much regard for individual differences in how learners actually master new tasks. Current research characterizes the learner as an active processor of information, who employs plans and strategies to acquire, store, and retrieve information from memory. For instance, several recent studies explored the strategies learners use to retain information in three verbal learning tasks: paired-associate learning (Blick & Boltwood, 1972), serial learning (Blick, Buonassissi, & Boltwood, 1972), and free recall (Blick & Waite, 1971). In each instance, college students were asked to report any methods or memory tricks they would use to perform the assigned task. For each task, students listed a variety of strategies and the majority of these involved some transformation of the stimulus material, such as memorizing first letters, clustering words, or using the words to form a descriptive story.

The realization that the learner in many cases actively transforms learning material has produced a "cognitive revolution" in psychological research (December, 1974). However, it has had relatively little impact upon current educational practice. That is, while we characterize the learner as playing an active role in learning, at least in laboratory situations,

this knowledge is usually not recognized in our attempt to teach subject matter to help individuals become more effective learners.

This situation is especially apparent when examining inventories and training manuals designed to diagnose and improve high school or college students' study practices. The majority of inventories and manuals focus upon external conditions which presumably lead to more effective and efficient study. Relatively little attention has been given to cognitive components of the study process. For example, Laycock and Russell (1941) found that among the 35 most frequently mentioned topics in how-to-study manuals were time management, systematic note taking, vocabulary improvement, proper underlining of books and finding a suitable place to work. Very little attention centered upon the cognitive activities of the learner himself, with the exception of advice concerning the development of a positive attitude and proper motivation for studying. An examination of more recently published study skills books indicates little change. The techniques presented in these books emphasize repetition, recitation, and review, or apply a limited selection of concepts derived from learning theory such as massed versus spaced practice and the interference theory of forgetting. Several books, including the widely used book by Pauk (1974), do contain some information and suggestions concerning the relationship between meaningfulness of the to-be-learned material and memory, but this is only a small section of the content presented.

This same problem is reflected in study skills inventories designed to assess students' study habits. Entwisle (1960) reviewed Carter's (1948, 1950, 1951, 1953, 1955) factor analyses of study habits inventories and found that such tests tap four principal factors: morale or self confidence, scholarly drive and values, study mechanics, and tendency to plan

to get work done. The learners' techniques or strategies for representing or remembering to-be-learned information have been largely ignored by those seeking to improve students' study skills. Most inventories have used what Svensson (1977) terms a "correlational" approach. That is, they seek to find behaviors or activities which are correlated with successful studying, but may not be the direct cause of successful learning.

Such a correlational approach is reflected by the manner in which study skills inventories are typically constructed or validated. For example, Carter (1958) constructed his California Study Methods Survey by weighting items on the basis of how well they distinguished between students with high and low grade point averages who had similar IQ and achievement test scores. A similar procedure was used as part of item selection for the Survey of Study Habits and Attitudes (Brown & Holtzman, 1967), the Effective Study Test (Brown, 1964), and the College Adjustment and Study Skills Inventory (Christensen, 1968).

While all of these inventories predict grade point average to a moderate degree (.19 to .60), they do not yield information about how the student learns, only the conditions under which he or she does it best. Svensson (1977) distinguishes this correlational approach from a functional approach which seeks to find the qualitative differences in how students study that may affect learning outcomes. For instance, in Svensson's research he found that students learned reading passages by attending to either specific details of the text or by searching for the intentional content signified by the facts presented. He found that a student's strategy for reading influenced both the amount and type of information recalled from the text (Svensson, 1977).

In another study, Goldman and Warren (1973) used discriminant analysis to pinpoint differences in study practices between college students with above and below average grade point averages. The authors concluded that two factors distinguish good from poor students: "diligence" in study habits, and an "active" learning style, which involved relating the to-be-learned material to previous knowledge. This distinction is similar to Svensson's and supports the notion of two important aspects of effective learning: suitable study habits, and effective cognitive strategies. Currently, there are a wide variety of instruments available to assess study habits, and relatively few instruments which focus upon students' strategies for learning.

One instrument which does assess both study skills and cognitive components of study is the Inventory of Learning Processes (ILP) by Schmeck, Ribich, and Ramanaiah (1977). The ILP was developed by writing items which the authors felt were behavioral descriptions of cognitive learning strategies discussed in current learning literature, such as elaboration, or adding associations to the presented material to make it more meaningful (Craig & Tulving, 1975) and mental imagery (Paivio, 1971). Several items which represented the authors' intuitive notions of effective study strategies were also included. A factor analysis of students' responses to these items supports the distinction between a cognitive and study skills component of effective learning. Four factors emerged, three reflecting the cognitive activities which the questionnaire was designed to measure, and a fourth factor involving traditional study skills.

Dansereau and his colleagues (Dansereau, Long, McDonald, & Actkinson, Note 2) have also developed a questionnaire designed to measure individual

differences in learning strategies or techniques. The Learning Strategy Inventory (LSI) contains 201 multiple-choice items based on previous study skills inventories and descriptions of learning activities based on topics discussed in current psychological or educational literature. On the basis of correlations of items with grade point average and verbal and mathematical portions of the Scholastic Aptitude Test, Dansereau and his associates identified four components of the learning process where the learner may use strategies to master the assigned task. These were: selection of material which is unfamiliar or important, techniques for comprehending and retaining important information, techniques for retrieving information, and effective coping with internal and external distractions. Using these four components, Dansereau has developed a program which trains students to use a variety of learning strategies, such as mental imagery and paraphrasing, in each of these four areas (Dansereau, Collins, McDonald, Holley, Garland, Diekhoff, & Evans, 1979).

Both the Inventory of Learning Processes and the Learning Strategy Inventory are designed to yield information concerning students' strategies for mastering information. The researchers who developed these instruments criticized previous researchers for using an "intuitive" approach to construct items, without using current learning research. Yet both Dansereau and Schmeck based their inventory items primarily upon their intuitive notions of how processes described in current learning literature might be used by students engaged in studying new material. Thus, these authors may have overlooked effective strategies and novel applications of previously identified strategies that may be used by effective and efficient learners.

In addition, these inventories have used a single population of subjects--undergraduate students. It is likely that other populations of



learners may use different strategies. The present research was conducted in order to explore the broadest range of strategies which learners may use to retain information, and also to expand the research findings concerning cognitive components of study to populations other than undergraduate college students. For this reason, an open-ended questionnaire was developed using information available in the research literature as well as data gathered in interviews with college students. This questionnaire was administered to several populations of learners. It was hoped by administering the questionnaire to several populations, differences between groups of learners in type and frequency of strategy use might help to identify the most effective strategies for several types of learning tasks.

#### Phase I: The Interview Study

The first step in the development of the Learning Activities Questionnaire (LAQ) was to determine types of strategies used by effective learners. An exploratory study was conducted with college students using a semi-structured interview format. The sessions were conducted around a core of structured questions from which the interviewer could diverge to probe for underlying factors or relationships, developmental history, or more specific factual information. In order to encourage the participants to report a range of strategies, a variety of learning tasks and stimulus materials were selected.

#### Method

Participants. The 72 students who participated in this study were drawn from several sections of an introductory educational psychology course at the University of Texas at Austin. Participation in research was part

of their course requirement.

Materials. Six lists of 15 items were used for the free recall tasks. These included: (1) a list of names of different animals and their classification; (2) a list of items from the following five categories: proper names, flowers, occupations, sports, and kitchen appliances; (3) a list of food items; (4) a list of household items; (5) a list of nouns randomly selected from the Paivio, Yuille, and Madigan norms (1968); and (6) a list of nouns selected from the Paivio et al. norms such that their meaningfulness ratings were in the average to high range of 5.8 to 7.4 (representing the average number of associations given by an individual in a one-minute period) and their concreteness ratings were in the average range of 3.7 to 4.7 (based on a 7-point scale). (Copies of these six lists can be found in Appendix A.)

Six lists were also constructed for the paired-associate learning tasks. Four of these lists had 15 word pairs selected from the nouns in the Paivio et al. (1968) norms. These included: (1) a list composed of average meaningfulness words (range = 5.5 to 6.5) of high concreteness (range = 6.37 to 6.80); (2) a list of average meaningfulness words (range = 5.5 to 6.5) of low concreteness (range = 2.13 to 3.83); (3) a list of average to high meaningfulness words (range = 5.8 to 7.4) of average concreteness (range = 3.7 to 4.7); and (4) a list of low meaningfulness words (range = 3.28 to 5.44) of average concreteness (range = 3.7 to 4.7). The fifth list had six pairs composed of proper names and phone numbers. The sixth list was composed of seven famous dates paired with the event, or events, that occurred on these dates. (Copies of these six lists can be found in Appendix A.)

The materials for the reading comprehension tasks included three different passages. The first, selected from a first aid manual, described the procedures to follow if someone ingests a poison (American National Red Cross, 1973). This selection contained highly structured, procedural material, similar to that found in technical training manuals. The second reading described the nature of social conformity (Morgan & King, 1971). This material, selected from an introductory psychology textbook, was similar in structure and style to many academic texts. The last passage was a short story called "The War of the Ghosts" (Bartlett, 1932). This story was included as an example of narrative prose. (Copies of these three readings can be found in Appendix A.)

Procedure. The students were assigned to one of three groups, 24 students per group. Each group received the same types of tasks but a different set of learning materials so that a broad range could be sampled.

Within each group, students were interviewed in subgroups of three. All interviews were recorded so the data would be available for further analysis. The semi-structured interviews were conducted around a core of questions from which the experimenter could diverge to probe for underlying factors concerning how a task was learned. Students were given a set of learning tasks to study one at a time. As they studied the material they were asked to write down any learning strategy, method, process, or "mental trick" that they used to help them learn the material. Students were also asked to write down any other method or strategy that they thought might be useful. After 5 minutes of study time, the strategies identified by the students were discussed. This discussion included a detailed description of each strategy. For example, if a student reported remembering an item by

saying, "I just picture it and think about it," the experimenter would follow up on the statement by requesting a concrete description of the image and the process by which it was formed. In addition, the discussion always included the following questions for each strategy identified:

How did you learn the strategy?

When did you learn it?

Why is it helpful?

Do you use this strategy on other materials?

If so, what other materials?

After all strategies for a given task were discussed, another task was presented. Each group received two free recall lists, two paired-associate lists, and a reading passage, in that order.

### Results and Discussion

A number of different strategies were identified by the students participating in the interview study. The next step in the development of the LAQ was to examine the student protocols and attempt to organize the data into coherent and meaningful strategy clusters. The results from three independent raters were used to generate the following eight category clusters:

1. Study skills and practice strategies.  
This category included standard study skills such as note taking, underlining, outlining, and paraphrasing, as well as practice techniques such as re-reading and copying.
2. Physical similarity and difference strategies.  
This category included learning words by noting common spelling patterns, looking for similarities or differences in sounds and comparing the number of syllables. This type of strategy was employed much more frequently with paired-associate and free recall tasks than with reading comprehension tasks.
3. Selection strategies.  
This category included selecting parts of words or readings,

such as abbreviations, acronyms, or alphabetizing and noting key words, major characters, or main ideas.

4. Imagery strategies.  
This category included forming images for the words or word pairs and for the events or ideas contained in the readings.
5. Meaningful elaboration strategies.  
This category included relating the new information to previous knowledge, experience, and attitudes, either directly or by analogy, and thinking about logical relationships and implications.
6. Phrase or sentence strategies.  
This category included creating phrases, sentences or rhymes to associate words or ideas. These methods were used primarily with the paired-associate tasks.
7. Meaningful similarity and difference strategies.  
This category included thinking about similarities and differences in word meanings or ideas. These methods were used primarily with the paired-associate and free recall tasks.
8. Organization and grouping strategies.  
This category included relating and categorizing words, ideas, or events.

#### Phase II: Construction of the Learning

##### Activities Questionnaire (LAQ)

One of the goals for this series of studies was to develop an instrument that could be used to collect data from a variety of learner populations. Since the interview format is not a cost-effective procedure, a self-contained questionnaire was designed to gather information about the use of learning strategies from a large number of individuals. A four-part instrument was constructed using the data gathered in the interview study.

Part I of the LAQ was designed to gather information similar to that collected in the interview study. Seven of the original 15 learning activities were used as the stimulus materials. This set included three paired-associate lists, two free recall lists, and two reading passages. These materials were contained in a booklet entitled Seven Learning

Activities (see Appendix B). The participants referred to their booklet while they were completing the LAQ.

In Part I of the LAQ the respondents answered the same open-ended questions that were used in the semi-structured interviews. The learners were asked to describe any methods or "mental tricks" that they used to learn and remember the information, events, or ideas contained in each set of activities (paired-associates, free recall, and reading comprehension). The respondents were referred to the Seven Learning Activities booklet for examples of each type of task. After describing any given strategy the participants were then asked to respond to the following series of questions:

How did you learn to use this kind of method?

How old were you when you first learned to use this method?

What does this method do to help you learn?

Do you use this method for any other learning tasks? If yes, what other learning tasks?

Additional comments?

Since most students reported using more than one strategy for each task in the interview study, this entire set of questions was repeated four times for each task type. The final question in each section asked the respondents to identify which of the methods they described was the best and to explain why they chose that method.

Part II of the LAQ consisted of a checklist of specific strategies. Respondents were asked to check those strategies which they had used in the past with materials similar to each of the three general types of tasks: paired-associate learning, free recall, and reading comprehension. The checklist was composed of the most commonly used, or representative,

strategies from each of the eight strategy categories derived from the semi-structured interviews. After completing the checklist, respondents were asked to write out any method or combination of methods, other than those listed, that they would also use to learn and remember the material in each type of task.

Part II was designed as a compromise between the open-ended format of Part I and the multiple-choice format used in previous inventories. The checklist format permitted easy scoring and analysis. The provision for respondent's comments or additional strategies allowed for the identification of strategies not included in the checklist.

A possible limitation of Parts I and II of the LAQ was that the learner's generation of the broadest range of strategies could be restricted by the stimulus tasks, i.e., the paired-associate, free recall, and reading comprehension materials. Therefore, Part III of the LAQ was constructed to allow respondents to report additional strategies that might be used with different learning tasks. In this section respondents were asked to report any other strategy, not already described, that they would use to learn information found in "texts, novels, newspapers and magazines, work materials, or other activities." The question format of Part III was identical to that of Part I.

Part IV of the LAQ consisted of a single page designed to collect demographic data, and asked respondents to indicate their age, sex, and educational level.

#### Phase III: Pilot Tests and Revisions of the LAQ

The first version of the LAQ was administered to a group of 20 graduate and undergraduate students enrolled in an undergraduate tests and measurements course at the University of Texas at Austin. Participation was part

of their course requirement. Following completion of the LAQ, the students were asked to respond to a series of items concerning the clarity of the LAQ instructions and questions. They were also asked to identify both the strong and the weak features of the instrument and to suggest modifications and improvements. The last two items asked if completing the LAQ had clarified any of the students' ideas about how they learned new material and if they had any additional comments. (A copy of these pilot-test items can be found in Appendix C.)

As a result of this pilot study, and a review of the instrument by two psychometricians, the LAQ was revised. In order to reduce the amount of time needed to complete the LAQ, the questions in Sections I and II concerning when and how a particular strategy was learned were changed from an open-ended to a multiple-choice format. In addition, several questions and a portion of the instructions were rewritten to improve their clarity and readability.

Upon completion of these revisions the LAQ was administered to a group of five community college students enrolled in a course preparing them to take a high school equivalency test. After completing the questionnaire these students also completed the set of pilot-test questions (see Appendix C). In addition, an instructional coordinator at the community college also reviewed and edited this version of the LAQ to improve its readability. As a result of the data collected in this pilot test, several changes were made in the wording of the directions used for Sections I and II. This revised form of the LAQ is the current version (See Appendix D).



## Phase IV: Research with the Learning

### Activities Questionnaire

The Learning Activities Questionnaire is being used to gather data about the types of strategies learners most frequently apply and the differences in the number and types of strategies used by respondents at various educational levels. Thus far, it has been administered to individuals at five different educational levels: graduate students, community college students, high school graduates, general equivalency diploma holders, and persons who had not completed high school. Based on the research literature in human learning and memory, the use of verbal and imaginal elaboration strategies should result in performance that is superior to that of simple practice and physical analysis strategies. Therefore, it was predicted that at higher levels of education, learners would report using more cognitive learning strategies, such as verbal and imaginal elaboration, as well as a greater variety of strategies.

### Method

Participants. The LAQ was administered to 331 individuals. The respondents differed in their educational level as follows: 35 respondents were graduate students (GRAD); 75 respondents were enrolled in a community college (CC); 86 respondents were high school graduates stationed at an Army base (HS); 86 respondents were general equivalency diploma holders from the same Army base (GED); and 49 respondents, also from the Army base, did not have high school diplomas (ND). All respondents participated as part of their course or work assignment.

Materials. The materials for this study included the LAQ and the Seven Learning Activities booklet. (Copies of these materials can be found

in Appendices B and D.)

Procedure. Participants completed the questionnaire in groups of 10 to 50 persons. Two proctors were available to answer any questions about the task or to clarify the directions. Completion time ranged from 40 to 90 minutes. The median was 70 minutes.

Results: LAQ, Part I

The results describing the types of strategies that learners most frequently apply and the differences between respondents at various educational levels will be presented.

In Part I of the LAQ, respondents described the methods they would use to learn each of the three general types of learning activities: paired-associates, free recall, and reading comprehension. A total of 1,658 responses were generated. As a result of the pilot tests, and a preliminary analysis of this data, it was decided to revise the original set of eight strategy clusters to form five strategy categories. This reclassification eliminated redundant categories which had, in some instances, made classification difficult. The five new strategy categories are:

1. Rote strategies.  
This category includes basic study skills and rote drills.  
Sample responses: "I try to memorize it" and "I say it over and over again."
2. Physical strategies.  
This category includes noting physical similarities and differences between words and parts of words or using only a portion of the stimulus. Sample responses: "I use the first letters to make a word" and "They both start with the same letter--M."
3. Imagery strategies.  
This category includes creating some sort of mental image.  
Sample responses: "I see it in my head" and "I picture myself doing the activity."

4. Elaboration strategies.  
This category includes relating previous knowledge, experiences, or attitudes to the new information. Sample responses: "I relate it to something I already know" and "I think of the logical implications of the material."
5. Grouping strategies.  
This category includes rearranging the material according to some classification scheme. Sample responses: "These are all vertebrates" and "They all belong together in the same group."

These five general strategy categories were used to organize the data collected from Part I of the LAQ. Respondents' learning strategies were placed into one of these categories. The inter-rater agreement on a subset of 35 questionnaires was 92%. The number of strategies used by each respondent in each of the strategy categories was then tabulated. Responses were also tabulated separately for each of the three task types.

In order to determine the types of strategies that learners in general most frequently apply, the 1,658 responses were divided into the five strategy categories. Rote strategies were reported most frequently (46%), followed by elaboration strategies (25%), physical strategies (13%), grouping strategies (9%), and imagery strategies (7%).

Further analyses of the data were then conducted to determine the differences in reported strategies between respondents at the various educational levels. Fifteen one-way analyses of variance were performed to compare the means of the five groups (educational levels) on their reported use of the five strategy categories for each of the three types of tasks. Post hoc analyses were performed using Duncan's Multiple Range Test at the .05 level of significance. The results of each one-way analysis of variance and the corresponding multiple range test appear in Tables 1 to 15. The means in these tables represent the average number of strategies

per person within each of the groups. The data are also represented graphically in Figures 1 to 3 which depict the percentage of individuals in each group who reported using one or more strategy for each of the types of tasks on Parts I and II of the LAQ. Although there were some inconsistencies in the data, a number of patterns were found. These will be discussed separately for each of the three types of tasks.

Free Recall Tasks. The analyses revealed significant differences among the groups in the mean number of strategies reported for each of the categories. With the exception of rote strategies, it was found that graduate students reported significantly higher use of all strategy types than did the remaining four groups, and that the means of the three non-college groups did not differ significantly from one another. The community college students reported using strategies which were similar to the non-college groups, with the exception being a significantly higher usage of grouping strategies. With respect to the use of rote strategies for these free recall tasks, the results indicated that educational level is not related in a consistent manner to the number of strategies reported.

Paired-associate Tasks. Significant differences among the groups were found on the use of all five strategy categories for the paired-associate tasks. As in the free recall tasks, no significant differences appeared among the non-college groups in use of the strategies other than the rote strategies. Graduate students reported higher use of imagery, elaboration, and grouping strategies than the remaining four groups. Within the physical strategy category, the community college group reported significantly higher use than the non-college groups. However, the mean for graduate students did not differ significantly from that of either the

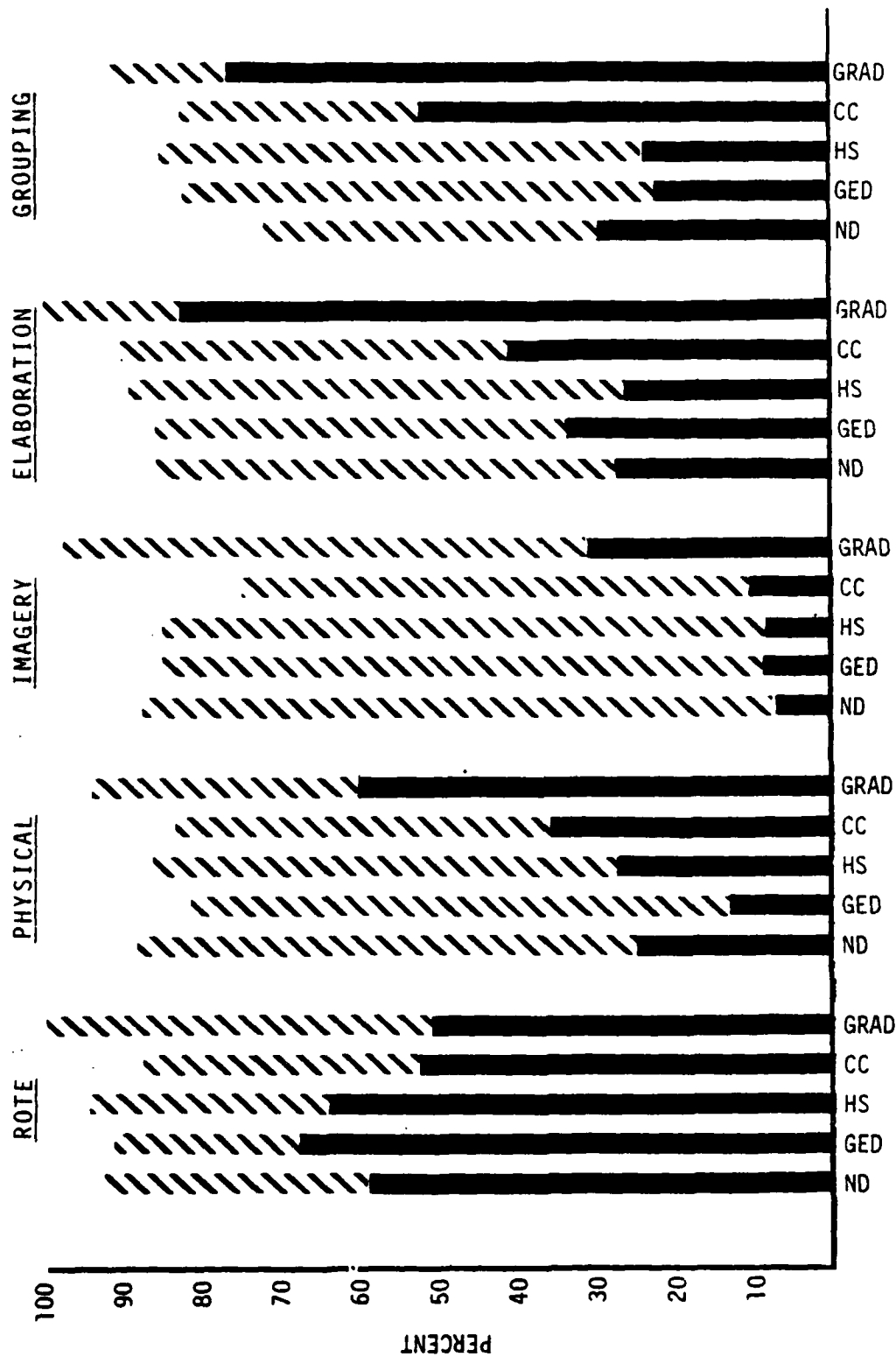




Figure 1. Percent of each group reporting use of the strategies on the free recall tasks (Part I = ; Part II = ).

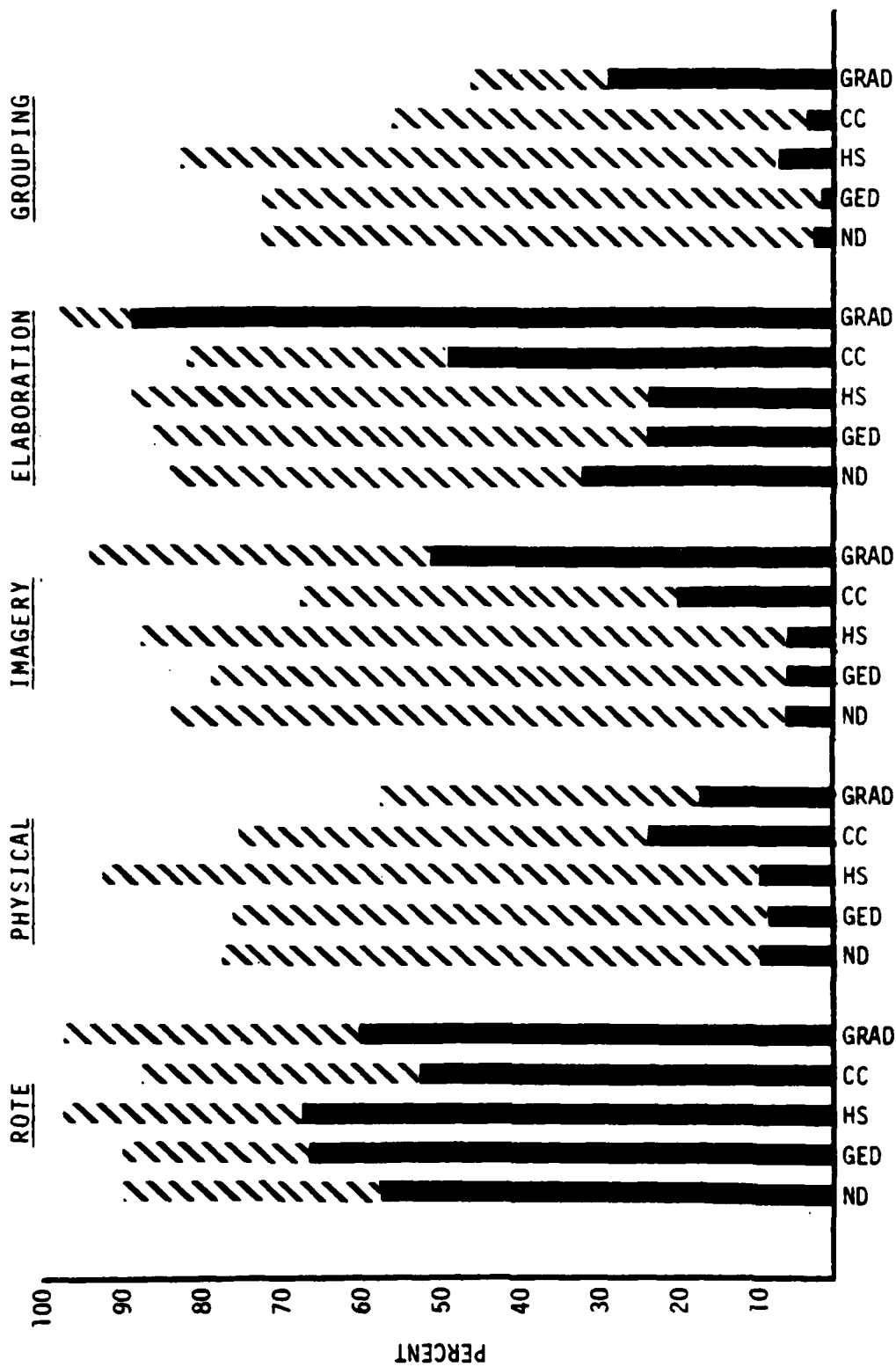


Figure 2. Percent of each group reporting use of the strategies on the paired-associate tasks (Part I =  ; Part II =  ).

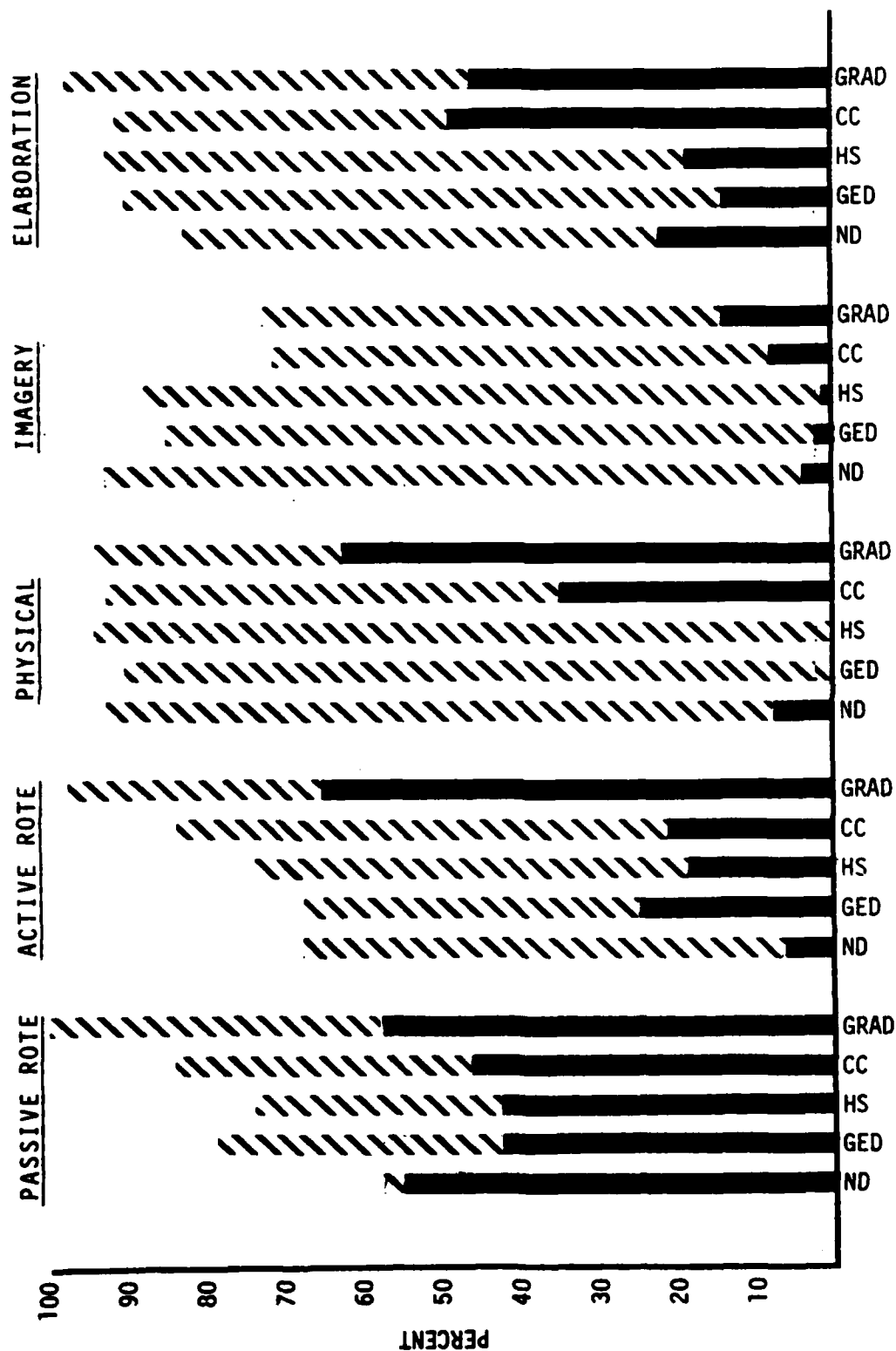


Figure 3. Percent of each group reporting use of the strategies on the reading comprehension tasks (Part I = ■ ; Part II = ▨ ).

non-college or the community college groups on the use of physical strategies for the paired-associate tasks.

Reading Comprehension Tasks. The strategy categories that were used in the analysis of the data for the reading comprehension tasks differed from those used for the other two types of tasks. Rote strategies were divided into passive and active. Passive rote strategies were those in which repetition was the sole method used to learn the material, whereas active rote strategies employed repetition as a means of applying other strategies on successive repetitions. Thus rereading alone would be classified as passive, but rereading and outlining would be classified as an active rote strategy. Grouping strategies were reported so infrequently that this category was eliminated from the analyses of the reading comprehension tasks.

Significant differences among the group means were found for each of the five strategy categories. Graduate students reported using all of the strategy categories significantly more than the non-college groups. The non-college groups did not differ from each other with the exception that the holders of general equivalency diplomas reported more frequent use of active rote strategies than did persons without high school diplomas. The mean of the community college group was not significantly different from the non-college groups in the use of either type of rote strategies, but community college students did report a higher use of physical strategies. With respect to imagery strategies, the mean of the community college group was between the non-college groups and the graduate students, and was not significantly different from either one.

#### Discussion: LAQ, Part I

It was predicted that as educational level increased, the use of



learning strategies which include verbal and imaginal elaboration of the material would also increase. This prediction was only partially supported. Graduate students, who might be expected to show the most sophisticated use of these strategies, did report a higher number and a broader variety. In 10 of the 15 comparisons among groups of learners, graduate students used the particular strategy significantly more than the remaining groups. The community college group reported using some strategies significantly more than non-college groups, but no clear patterns were evident. In several instances the community college students also used strategies at a level similar to that of the graduate students. With the exception of rote methods, the non-college groups reported the lowest use of strategies in almost every case.

In general, rote strategies appeared to be used frequently by all groups of respondents for most tasks. However, graduate students supplemented rote strategies with additional strategies from the remaining four strategy categories with some frequency. This suggests that learners at lower educational levels may not have developed a broad repertoire of learning strategies and depend, to a large degree, on rote strategies.

#### Results and Discussion: LAQ, Part II

In Part II of the LAQ, participants were given a checklist of strategies and asked to mark each strategy that they had used in the past to learn material similar to the free recall, paired-associate and reading comprehension tasks used in Part I. The strategies were also classified into the same categories as those used in Part I. Figures 1 to 3 show the percentage of participants in each group who reported using at least one strategy in a particular category for the three types of tasks on both Part I and Part II of the LAQ. In nearly all instances, the reported use of the strategies is

much higher on Part II than on Part I, and in those instances in which the differences between Parts I and II are small, the group had reported a high usage of the strategy on Part I as well as on Part II. The large increases in reported use of the strategies on Part II, which was in a multiple-choice format, as compared to that of Part I, which had an open-ended format, suggest an inflation of the data from Part II which may represent an effect of social desirability or an attempt to comply with the perceived demands of the experimental situation, rather than the actual use of the strategies by the participants.

When an individual is faced with a learning task, he or she generates strategies to learn the material, and then uses those that appear to be most effective for the particular task. Part I of the LAQ requires the participant to engage in this same process, whereas Part II does not. Therefore, the strategies reported on Part I may be more representative of the strategies that the respondents would generate if they were in an actual learning situation using these materials. Part II may reflect those strategies that the respondents select as potentially useful strategies, although they would not necessarily generate these on their own when faced with a learning situation.

If the purpose of an instrument is to determine which strategies respondents actually might apply in a learning situation, the use of checklists or multiple-choice formats is not suggested, based on the inflated reports found on Part II of the LAQ, as compared to those on Part I. Therefore, Part II will be omitted from the LAQ for future administrations.

### Results and Discussion: LAQ, Part III

Part III of the LAQ asked learners to describe any other strategies or methods that they would use to learn information in texts, novels, newspapers and magazines, work materials or other activities. Few responses were obtained from this section. In addition, those strategies that were reported represented ones which had already been identified on Part I. This lends further support for the comprehensiveness of the strategy categories identified in the development phase. Therefore, Part III will be omitted from future administration of the LAQ.

### General Discussion

The Learning Activities Questionnaire was developed to provide information concerning the use of cognitive learning strategies. Responses from both the semi-structured interviews and the LAQ indicated that learners use a broad variety of strategies to master learning tasks. Questionnaires and study inventories which assess only the learner's use of traditional study skills may be ignoring a primary source of differences between learners. In addition, the finding that the number of verbal and imaginal elaboration strategies reported on the LAQ varies with educational level points to the importance of further investigation of the relationship between these strategies and learning performance.

The classification system used for analysis of strategies reported by respondents on the LAQ can provide a framework for further study of cognitive strategies. Research concerning the effectiveness of elaboration, grouping, physical, and imagery strategies and their use by learners is needed. While rote strategies were frequently reported by learners, a substantial body of research already exists concerning the use of rehearsal in memory performance, and most study inventories include questions concerning

various types of rote strategies.

Perhaps the most important findings concern the differential use of verbal and imaginal elaboration strategies by learners at different levels of education. Across all task types, a general pattern emerged--those respondents in a college setting (graduate school or community college) reported using a wider variety of these strategies. Non-college respondents appeared to depend primarily on rote strategies to master learning tasks. Though college-level respondents also reported high usage of rote strategies, these were supplemented with other cognitive strategies. This relationship between academic level and cognitive strategies reported may be explained with the levels of processing framework for memory suggested by Craik and Lockhart (1972). They assert that repetition of to-be-learned material will only improve memory performance if such strategies lead to "deeper" analysis of the material. In this sense, depth refers to stages in the processing of information. Deeper analyses are those concerned with extraction of meaning, associations of new material with past experience and relating new information to existing knowledge. Strategies such as elaboration, grouping, and imagery would be classified as deep levels of processing. One would expect that supplementing repetition with these strategies, as college students report, would lead to increased memory performance.

#### Future Directions

The research and development effort described in this report will continue as part of the Cognitive Learning Strategies Project at the the University of Texas at Austin. The goals of this project are to refine our understanding of the covert processes involved in utilizing cognitive

strategies for learning and retention, and to design, develop, and field test training programs to modify learners' information processing strategies. As we increase our understanding of information-processing skills that contribute to effective and efficient learning, we will be able to provide heuristic means for the individual learner to use in identifying, monitoring, modifying, and implementing a plan for achieving instructional goals.

TABLE 1

Summary of Results of the Analysis of Variance and Duncan's Multiple Range Test for Rote Strategies in the Free Recall Tasks in Part I of the LAQ.

<u>Source</u>	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Between groups	8.94	4	2.23	4.05	<.01
Within groups	179.73	326	.55		
Total	188.66	330			

	Educational Level				
	CC	ND	GRAD	HS	GED
N	75	49	35	86	86
Mean	.55	.59	.74	.84	.97
Standard Deviation	.53	.50	.92	.81	.86

\*Subsets

Summary of Significant Differences Between Means ( $p < .05$ )

GED>ND,CC  
HS>CC

\*Within subsets, means do not differ significantly from one another.

TABLE 2

Summary of Results of the Analysis of Variance and Duncan's Multiple Range Test for Physical Strategies in the Free Recall Tasks in Part I of the LAQ

<u>Source</u>	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Between groups	11.64	4	2.91	10.88	<.001
Within groups	87.13	326	.27		
Total	98.76	330			

	Educational Level				
	GED	ND	HS	CC	GRAD
N	86	49	86	75	35
Mean	.14	.24	.30	.40	.80
Standard Deviation	.35	.43	.53	.57	.76

\*Subsets

Summary of Significant Differences Between Means ( $p < .05$ )

GRAD>CC,HS,ND,GED  
CC>GED

\*Within subsets, means do not differ significantly from one another.

TABLE 3

Summary of Results of the Analysis of Variance and Duncan's Multiple Range Test for Imagery Strategies in the Free Recall Tasks in Part I of the LAQ

<u>Source</u>	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Between groups	1.88	4	.47	3.94	< .01
Within groups	38.79	326	.12		
Total	40.67	330			

	Educational Level				
	ND	GED	HS	CC	GRAD
N	49	86	86	75	35
Mean	.08	.09	.10	.12	.34
Standard Deviation	.28	.29	.34	.33	.54
*Subsets					

Summary of Significant Differences Between Means ( $p < .05$ )

GRAD>CC,HS,GED,ND

\*Within subsets, means do not differ significantly from one another.



TABLE 4

Summary of Results of the Analysis of Variance and Duncan's Multiple Range Test for Elaboration Strategies in the Free Recall Tasks in Part I of the LAQ

<u>Source</u>	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Between groups	18.09	4	4.52	13.75	<.001
Within groups	107.26	326	.33		
Total	125.35	330			

	<u>Educational Level</u>				
	ND	HS	GED	CC	GRAD
N	49	86	86	75	35
Mean	.27	.29	.41	.44	1.09
Standard Deviation	.49	.51	.64	.55	.70
*Subsets					

Summary of Significant Differences Between Means ( $p < .05$ )

GRAD>CC, GED, HS, ND

\*Within subsets, means do not differ significantly from one another.

TABLE 5

Summary of Results of the Analysis of Variance and Duncan's Multiple Range Test for Grouping Strategies in the Free Recall Tasks in Part I of the LAQ

<u>Source</u>	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Between groups	9.67	4	2.42	8.38	<.001
Within groups	94.08	326	.29		
Total	103.75	330			

	<u>Educational Level</u>				
	GED	ND	HS	CC	GRAD
N	86	49	86	75	35
Mean	.24	.31	.35	.53	.80
Standard Deviation	.46	.47	.66	.53	.47
*Subsets	_____	_____	_____	_____	_____

Summary of Significant Differences Between Means ( $p < .05$ )

GRAD>CC,HS,ND,GED

CC>HS,ND,GED

\*Within subsets, means do not differ significantly from one another.

TABLE 6

Summary of Results of the Analysis of Variance and Duncan's Multiple Range Test for Rote Strategies in the Paired-Associate Tasks in Part I of the LAQ

Source	SS	df	MS	F	p
Between groups	4.31	4	1.08	2.64	<.05
Within groups	133.00	326	.41		
Total	137.31	330			

	Educational Level				
	ND	CC	GRAD	GED	HS
N	49	75	35	86	86
Mean	.57	.59	.69	.79	.85
Standard Deviation	.50	.59	.63	.67	.71

\*Subsets

Summary of Significant Differences Between Means ( $p < .05$ )

HS>CC,ND

\*Within subsets, means do not differ significantly from one another.

TABLE 7

Summary of Results of the Analysis of Variance and Duncan's Multiple Range Test  
for Physical Strategies in the Paired-Associate Tasks in Part I of the LAQ

<u>Source</u>	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Between groups	1.93	4	.48	2.71	<.05
Within groups	57.90	326	.18		
Total	59.83	330			

	<u>Educational Level</u>				
	ND	GED	HS	GRAD	CC
N	49	86	86	35	75
Mean	.10	.10	.12	.17	.29
Standard Deviation	.31	.41	.36	.38	.56

\*Subsets

Summary of Significant Differences Between Means ( $p < .05$ )

CC>HS,GED,ND

\*Within subsets, means do not differ significantly from one another.

TABLE 8

Summary of Results of the Analysis of Variance and Duncan's Multiple  
Range Test for Imagery Strategies in the Paired-Associate Tasks in Part I of the LAQ

<u>Source</u>	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Between groups	9.11	4	2.28	19.22	<.001
Within groups	38.63	326	.12		
Total	47.75	330			

	Educational Level				
	HS	GED	ND	CC	GRAD
N	86	86	49	75	35
Mean	.06	.06	.06	.20	.60
Standard Deviation	.24	.24	.24	.40	.65
*Subsets					

Summary of Significant Differences Between Means ( $p < .05$ )

GRAD>CC,ND,GED,HS  
CC>ND,GED,HS

\*Within subsets, means do not differ significantly from one another.

TABLE 9

Summary of Results of the Analysis of Variance and Duncan's Multiple Range Test  
for Elaboration Strategies in the Paired-Associate Tasks in Part I of the LAQ

<u>Source</u>	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Between groups	53.26	4	13.31	35.73	<.001
Within groups	121.49	326	.37		
Total	174.74	330			

	Educational Level				
	GED	HS	ND	CC	GRAD
N	36	86	49	75	35
Mean	.29	.30	.33	.53	1.63
Standard Deviation	.55	.60	.47	.60	.91
*Subsets					

Summary of Significant Differences Between Means ( $p < .05$ )

GRAD>CC,ND,HS,GED  
CC>HS,GED

\*Within subsets, means do not differ significantly from one another.

TABLE 10

Summary of Results of the Analysis of Variance and Duncan's Multiple Range Test  
for Grouping Strategies in the Paired-Associate Tasks in Part I of the LAQ

<u>Source</u>	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Between groups	2.10	4	.52	9.72	<.001
Within groups	17.57	326	.05		
Total	19.67	330			

	Educational Level				
	GED	ND	CC	HS	GRAD
N	86	49	75	86	35
Mean	.01	.02	.04	.07	.29
Standard Deviation	.11	.14	.20	.26	.46

\*Subsets

Summary of Significant Differences Between Means ( $p < .05$ )

GRAD>HS,CC,ND,GED

\*Within subsets, means do not differ significantly from one another.

TABLE 11

Summary of Results of the Analysis of Variance and Duncan's Multiple Range Test  
for Passive Rote Strategies in the Reading Comprehension Tasks in Part I  
of the LAQ

<u>Source</u>	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Between groups	4.76	4	1.19	2.87	< .05
Within groups	135.35	326	.42		
Total	140.11	330			

	Educational Level				
	GED	CC	HS	ND	GRAD
N	86	75	86	49	35
Mean	.48	.49	.51	.55	.89
Standard Deviation	.63	.55	.68	.50	.90
*Subsets					

Summary of Significant Differences Between Means ( $p < .05$ )

GRAD>ND,HS,CC,GED

\*Within subsets, means do not differ significantly from one another.



TABLE 12

Summary of Results of the Analysis of Variance and Duncan's Multiple Range Test for Active Rote Strategies in the Reading Comprehension Tasks in Part I of the LAQ

<u>Source</u>	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Between groups	17.29	4	4.32	16.60	<.001
Within groups	84.87	326	.26		
Total	102.16	330			

	Educational Level				
	ND	HS	CC	GED	GRAD
N	49	86	75	86	35
Mean	.06	.20	.23	.31	.91
Standard Deviation	.24	.43	.45	.58	.82

\*Subsets

Summary of Significant Differences Between Means ( $p < .05$ )

GRAD>GED,CC,HS,ND  
GED>ND

\*Within subsets, means do not differ significantly from one another.

TABLE 13

Summary of Results of the Analysis of Variance and Duncan's Multiple Range Test for Physical Strategies in the Reading Comprehension Tasks in Part I of the LAQ

<u>Source</u>	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Between groups	23.57	4	5.90	41.58	<.001
Within groups	46.19	326	.14		
Total	69.76	330			

	Educational Level				
	HS	GED	ND	CC	GRAD
N	86	86	49	75	35
Mean	0	0	.08	.37	.83
Standard Deviation	0	0	.28	.54	.79
*Subsets					

Summary of Significant Differences Between Means ( $p < .05$ )

GRAD>CC,ND,GED,HS  
CC>ND,GED,HS

\*Within subsets, means do not differ significantly from one another.

TABLE 14

Summary of Results of the Analysis of Variance and Duncan's Multiple Range Test for Imagery Strategies in the Reading Comprehension Tasks in Part I of the LAQ

<u>Source</u>	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Between groups	.56	4	.14	3.12	< .05
Within groups	14.67	326	.04		
Total	15.23	330			

	Educational Level				
	HS	GED	ND	CC	GRAD
N	86	86	49	75	35
Mean	.01	.02	.04	.08	.14
Standard Deviation	.11	.15	.20	.27	.36

\*Subsets

Summary of Significant Differences Between Means ( $p < .05$ )

GRAD>ND,GED,HS

\*Within subsets, means do not differ significantly from one another.

TABLE 15

Summary of Results of the Analysis of Variance and Duncan's Multiple Range Test for Elaboration Strategies in the Reading Comprehension Tasks in Part I of the LAQ

<u>Source</u>	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Between groups	8.11	4	2.03	6.69	<.001
Within groups	98.83	326	.30		
Total	106.95	330			

	Educational Level				
	GED	ND	HS	CC	GRAD
N	86	49	86	75	35
Mean	.15	.24	.26	.44	.66
Standard Deviation	.39	.48	.56	.55	.87

\*Subsets

Summary of Significant Differences Between Means ( $p < .05$ )

GRAD>HS,ND,GED  
CC>GED

\*Within subsets, means do not differ significantly from one another.

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APPENDIX A

Materials Used in the Interview Study

FREE RECALL LISTS

LIST 1

GRASSHOPPER  
ANIMAL  
REPTILE  
LASSIE  
BIRD  
MAMMAL  
WASP  
DOG  
CANARY  
EAGLE  
COLLIE  
INSECT  
ALLIGATOR  
HORSE  
GIRAFFE

LIST 2

TOASTER  
GOLF  
SUSAN  
SWIMMING  
TEACHER  
LARRY  
BOWLING  
BLENDER  
DAISY  
LAWYER  
BROILER  
TULIP  
PAUL  
CARNATION  
PLUMBER

LIST 3

CRACKERS  
TOMATOES  
CHICKEN  
PICKLES  
SOUP  
GRAPES  
LETTUCE  
TEA  
MUSTARD  
ICE  
BREAD  
SALT  
STEAK  
WATERMELON  
MILK

FREE RECALL LISTS

LIST 4

CHAIR  
DRESSER  
REFRIGERATOR  
MIRROR  
STOOL  
CABINET  
BATHTUB  
LAMP  
CARPET  
SOFA  
TOASTER  
BED  
BOOKCASE  
PLANT  
TELEPHONE

LIST 5

LOQUACITY  
HAMLET  
CHLORIDE  
PIPE  
CONTRIBUTION  
AGONY  
SEAT  
RIVER  
IRON  
FOX  
PERIODICAL  
PERCEPTION  
CAPTIVE  
VOLCANO  
HENCHMAN

LIST 6

ANECDOTE  
VOLUME  
HEALTH  
SHOCK  
RESEARCH  
CHAOS  
FREEDOM  
BACKGROUND  
POLLUTION  
SETTLEMENT  
MILEAGE  
LAW  
BLESSING  
LIFE  
RHEUMATISM

# PAIRED-ASSOCIATE LISTS

## LIST 1

NAIL - BEGGAR  
 DRESS - LIP  
 DOVE - TRUCK  
 MOTHER - DOLLAR  
 ROCK - NEWSPAPER  
 ACCORDION - PHYSICIAN  
 CIGAR - HOTEL  
 LETTER - FACTOR  
 BARREL - SEAT  
 PIANIST - PUPIL  
 TWEEZERS - BOUQUET  
 STEAMER - FRIEND  
 PIPE - LIBRARY  
 FLASH - HEADLIGHT  
 SLIPPER - BAR

## LIST 2

SOUL - VIOLATION  
 MIND - PROMOTION  
 POSITION - LAW  
 MALADY - INTELLECT  
 WELFARE - LENGTH  
 DEMOCRACY - PLEDGE  
 EFFORT - CHANCE  
 LEGISLATION - STYLE  
 EDITION - ECONOMY  
 COST - EGO  
 HIDE - HEREDITY  
 INTEREST - DYNASTY  
 HOUR - DUTY  
 THEORY - GUILTY  
 NECESSITY - ABILITY

## LIST 3

HOMICIDE - LENGTH  
 TIME - CODE  
 MISERY - VOCATION  
 MATHEMATICS - LORD  
 POWER - FORTUNE  
 AIR - GLORY  
 MOLECULE - CONTRACT  
 JOKE - CHARM  
 SCIENCE - OPIUM  
 ATMOSPHERE - HEARING  
 BRAVERY - DIRECTION  
 OXYGEN - HEROISM  
 VENOM - EXERTION  
 GRIEF - ERRAND  
 PEP - CRIME

PAIRED-ASSOCIATE LISTS

LIST 4

SALARY - HENCHMAN  
BOREDOM - ENSEMBLE  
IMPULSE - ECCENTRICITY  
VANITY - DELUGE  
MENACE - SHAME  
DEMON - PREVIEW  
ABDICATION - INSTITUTE  
MADNESS - KINDNESS  
OBSESSION - PRODUCT  
CHARTER - AUTHOR  
HATRED - INHABITANT  
GADFLY - PACIFISM  
PROFESSION - HABITATION  
RITUAL - DISTURBER  
STRENGTH - EXTERMINATION

LIST 5

JOE 437-2981  
KATHY 678-4252  
JIM 371-2874  
SUSAN 471-1044  
GARY 352-9866  
MARY 569-1386

## PAIRED-ASSOCIATE LISTS

### LIST 6

- September 1, 1939 -- German troops invaded Poland
- September 3, 1939 -- Britain and France declared war on Germany
- June 10, 1940 -- Italy declared war on Britain and France
- June 22, 1940 -- France surrendered to Germany
- December 7, 1941 -- The Japanese attacked Pearl Harbor
- December 8, 1941 -- The United States declared war on Japan
- December 11, 1941 -- Germany and Italy declared war on the United States.  
The United States declared war on Germany and Italy.

## READING ONE

### FIRST AID - POISONS

The objectives in treatment of poisoning by mouth are to dilute or neutralize the poison as quickly as possible, to induce vomiting (except when corrosive poisons are swallowed or if victim is unconscious or having convulsions), to maintain respiration, to preserve vital functions, and to seek medical assistance without delay. Begin to carry out the above objectives as quickly as possible, choosing one of the following alternatives:

- A. When you do know that the victim has not swallowed a strong acid, strong alkali, or petroleum product, but do not have the original container.
  - 1. Dilute the poison with water or milk.
  - 2. Induce vomiting (except for strong acids, strong alkalis, and petroleum products).
  - 3. Get medical help immediately.
- B. You do not know what poison the victim swallowed.
  - 1. Dilute the poison with water or milk.
  - 2. Try to find out what poison has been swallowed (Look for the original container).
  - 3. Get help immediately.

Source: The American National Red Cross (1973)

## READING TWO

### CONFORMITY

Belonging to a group affects behavior profoundly. Groups have a major role in determining our attitudes, beliefs, actions, decisions, and behavior toward other people. Conformity is a general term that simply means "going along with" the behaviors, attitudes, and beliefs of a group. We may go along either because we believe in what the group does and stands for, or because we are bowing to group pressures without feeling convinced of the group's "rightness." The term private acceptance is sometimes used when we make the group's values and behaviors our own. The word compliance is sometimes used when we go along with the group because of group pressures without changing our private attitudes and beliefs.

These aspects of conformity, private acceptance and compliance, are very difficult to disentangle; there is probably an element of both in most conformity behavior. Thus when we speak of conformity, we are only describing a tendency of people to go along; usually we cannot say why they do.

We are all members of social groups that influence our behavior and attitudes. Groups exert this influence powerfully and pervasively through group norms. A norm, as the term implies, is a standard of behavior, but it is more than that. To understand its precise nature, we must refer to the concepts of role and status.

A role is the behavior expected of us in a particular status. The accent should be placed on the word "expected." A group can expect certain behavior from us because it can turn its disapproval on us if

we do not do what is expected. Since most of us acquire the need for social approval, and hence do not wish to incur disapproval, we conform to our group's expectations. For example, as members of many groups - family, university, church, community, commune, and so on - we have many expected roles we must play. We must somehow conform to the expectations of the group or suffer the disapproval of the group members. These expectations constitute group norms, which may be defined more formally as widely shared expectations among most members of a group, class, or culture.

Group norms seem to emerge, like statuses and social structure, whenever a group is formed. A group exists when interaction occurs among individuals. By interaction we mean any conversation, exchange of goods and services, or joint efforts which cast group members into any kind of status. The longer people interact, and the more they interact, the more they tend to adopt common ways of perceiving the world. From shared perceptions, it is only a short step to shared rules or norms governing the behavior of group members in each status position. The difference is that norms have a demand quality. Not only does an individual tend to see the world and act the way other group members do, but he must do so or suffer the social consequences. To enforce this demand, the group devises different degrees of punishment ranging all the way from capital punishment for major crimes to something as innocuous as a social snub. In between are many tangible and effective methods of demanding conformity to group norms. Adolescents and young adults, for instance, may be forced to leave home if they do not conform to the major behaviors, attitudes, and beliefs of their families. The person who marries someone of another religion or race may suffer ostracism and other social punishment from



the groups whose norms he violated. Even hair styles and dress styles, if they deviate from the group norm, can be the occasion for social demands and pressures. It is strange but true: most groups do not tolerate much deviation from their norms before social sanctions are brought to bear.

Source: Morgan and King (1971)

### READING THREE

#### THE WAR OF THE GHOSTS

One night two young men from Egulac went down to the river to hunt seals, and while they were there it became foggy and calm. Then they heard war-cries, and they thought: "Maybe this is a war-party". They escaped to the shore, and hid behind a log. Now canoes came up, and they heard the noise of paddles, and saw one canoe coming up to them. There were five men in the canoe, and they said:

"What do you think? We wish to take you along. We are going up the river to make war on the people".

One of the young men said: "I have no arrows".

"Arrows are in the canoe," they said.

"I will not go along, I might be killed. My relatives do not know where I have gone. But you", he said, turning to the other, "may go with them."

So one of the young men went, but the other returned home.

And the warriors went on up the river to a town on the other side of Kalama. The people came down to the water, and they began to fight, and many were killed. But presently the young man heard one of the warriors say: "Quick, let us go home: that Indian has been hit". Now he thought: "Oh, they are ghosts". He did not feel sick, but they said he had been shot.

So the canoes went back to Egulac, and the young man went ashore to his house, and made a fire. And he told everybody and said: "Behold I accompanied the ghosts, and we went to fight. Many of our fellows were killed, and many of those who attacked us were killed. They said I was hit, and I did not feel sick."

He told it all, and then he became quiet. When the sun rose he fell down. Something black came out of his mouth. His face became contorted. The people jumped up and cried.

He was dead.

Source: Bartlett (1932)

## APPENDIX B

### SEVEN LEARNING ACTIVITIES

#### ACTIVITY ONE

##### Highlights of World War II--The Early Years

September 1, 1939--German troops invaded Poland

September 3, 1939--Britain and France declared war on Germany

June 10, 1940--Italy declared war on Britain and France

June 22, 1940--France surrendered to Germany

December 7, 1941--The Japanese attacked Pearl Harbor

December 8, 1941--The United States declared war on Japan

December 11, 1941--Germany and Italy declared war on the United States.

The United States declared war on Germany and Italy.

#### ACTIVITY TWO

NAIL - BEGGAR  
DRESS - LIP  
DOVE - TRUCK  
MOTHER - DOLLAR  
ROCK - NEWSPAPER  
ACCORDIAN - PHYSICIAN  
CIGAR - HOTEL  
LETTER - FACTOR  
BARREL - SEAT  
PIANIST - PUPIL  
TWEEZERS - BOUQUET  
STEAMER - FRIEND  
PIPE - LIBRARY  
FLASH - HEADLIGHT  
SLIPPER - BAR

#### ACTIVITY THREE

SOUL - VIOLATION  
MIND - PROMOTION  
POSITION - LAW  
MALADY - INTELLECT  
WELFARE - LENGTH  
DEMOCRACY - PLEDGE  
EFFORT - CHANCE  
LEGISLATION- STYLE  
EDITION - ECONOMY  
COST - EGO  
HIDE - HEREDITY  
INTEREST - DYNASTY  
HOUR - DUTY  
THEORY - GUILTY  
NECESSITY - ABILITY

#### ACTIVITY FOUR

ANECDOTE  
VOLUME  
HEALTH  
SHOCK  
RESEARCH  
CHAOS  
FREEDOM  
BACKGROUND  
POLLUTION  
SETTLEMENT  
MILEAGE  
LAW  
BLESSING  
LIFE  
RHEUMATISM

#### ACTIVITY FIVE

GRASSHOPPER  
ANIMAL  
REPTILE  
LASSIE  
BIRD  
MAMMAL  
WASP  
DOG  
CANARY  
EAGLE  
COLLIE  
INSECT  
ALLIGATOR  
HORSE  
GIRAFFE

## ACTIVITY SIX

### FIRST AID - POISONS

The objectives in treatment of poisoning by mouth are to dilute or neutralize the poison as quickly as possible, to induce vomiting (except when corrosive poisons are swallowed or if victim is unconscious or having convulsions), to maintain respiration, to preserve vital functions, and to seek medical assistance without delay. Begin to carry out the above objectives as quickly as possible, choosing one of the two following alternatives:

- A. When you do know that the victim has not swallowed a strong acid, strong alkali, or petroleum product, but do not have the original container.
  - 1. Dilute the poison with water or milk.
  - 2. Induce vomiting (except for strong acids, strong alkalies, and petroleum products).
  - 3. Get medical help immediately.
- B. You do not know what poison the victim swallowed.
  - 1. Dilute the poison with water or milk.
  - 2. Try to find out what poison has been swallowed.  
(Look for the original container.)
  - 3. Get medical help immediately.

Source: The American National Red Cross (1973)

## ACTIVITY SEVEN

### CONFORMITY

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and hence do not wish to incur disapproval, we conform to our group's expectations. For example, as members of many groups - family, university, church, community, commune, and so on - we have many expected roles we must play. We must somehow conform to the expectations of the group or suffer the disapproval of the group members. These expectations constitute group norms, which may be defined more formally as widely shared expectations among most members of a group, class, or culture.

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for social demands and pressures. It is strange but true: most groups do not tolerate much deviation from their norms before social sanctions are brought to bear.

Source: Morgan and King (1971)

## APPENDIX C

### Pilot Test Questions

This questionnaire will later be used again with other people. Please help us to make sure that it is clear, understandable, and easy to follow by answering the following questions. (Use the back of this sheet if you need more room for your answers.)

1. How long did it take you to complete the questionnaire?
2. Were any questions not clear? If yes, then which ones?
3. Were the instructions clear? If not, what was not clear? How could we make it better?
4. What were the strongest points in the questionnaire?

5. What were the weakest points?

6. Do you have any suggested modifications or improvements?

7. Did this questionnaire clarify any of your ideas about how you do learn or how you might try to be a more effective learner? If yes, how?

8. Additional comments:

## APPENDIX D

### LEARNING ACTIVITIES QUESTIONNAIRE

First we want to thank you for helping us by filling out this questionnaire. It really does mean a lot to us, and what we find out may help future students. Different people have different ways of learning. We are trying to find out what these different ways are so that we can help other people to learn better.

You also should have a separate handout with seven learning activities. After you look at these activities we are going to ask you to describe how you would learn them. You will not be tested over this material and you will not need to actually learn it. Instead, we just want you to try to think of ways that you could learn them.

THIS IS NOT A TEST. THERE ARE NO "RIGHT" OR "WRONG" ANSWERS, AND THE RESULTS WILL NOT BE USED FOR ANY KIND OF GRADING. If there are any questions you don't want to answer, feel free to leave them blank. Also, if you have any comments you want to add, go ahead and do so.

If you have any questions or are not sure how to answer a section ask the person giving you the questionnaire. If no one is around to help you just do the best you can. REMEMBER, THIS IS NOT A TEST, SO NOTHING "TERRIBLE" WILL HAPPEN IF YOU HAVE A PROBLEM.

Please continue going through the whole questionnaire until you reach the end. There is no time limit, but we figure it should take you about 1 - 2 hours to finish.

## PART I

### DIRECTIONS FOR LEARNING ACTIVITIES ONE AND TWO

TAKE THE HANDBOOK OUT WITH THE TITLE "SEVEN LEARNING ACTIVITIES" AND LOOK AT THE PAGE WHICH HAS LEARNING ACTIVITIES ONE AND TWO ON IT. SAY YOU HAD TO LEARN EACH OF THE LISTS SO THAT YOU COULD LATER WRITE DOWN THE WORDS IN ANY ORDER WITHOUT SEEING THE ORIGINAL LIST. THIS WOULD BE LIKE TRYING TO REMEMBER A GROCERY LIST OR ANY OTHER SIMILAR TYPE OF LIST.

FOR EXAMPLE: If you were given this list to learn: window

lion

chair

girl

and the list was then taken away, you would have to be able to write down all of the words on it from memory, in any order.

FOR EXAMPLE: lion

girl

chair

window

After you have looked at the Learning Activities One and Two, we want you to tell us how you would learn them. Tell us the ways, methods, or "mental tricks" you would use on any one or both of the activities to help yourself learn. Tell us about as many ways as you can think of. The following three pages provide spaces for your answers about Activities One and Two. Describe two methods on each page and if you need more paper, just write on the back of these pages. You also do not have to have four or more methods, but try to tell us as many of the methods as you can.

I. a) Describe one method or "mental trick" you would use to remember the word list on either Activity One or Activity Two.

b) How did you learn to use this kind of method?  
taught by 1) self \_\_\_ 2) teacher \_\_\_ 3) friends \_\_\_ 4) parents \_\_\_  
5) other (specify) \_\_\_\_\_

c) How old were you when you first learned to use this method?  
1) pre-school \_\_\_ 2) elementary school \_\_\_ 3) junior high \_\_\_  
4) high school \_\_\_ 5) since high school \_\_\_

d) What does this method do to help you learn?

e) Do you use this method for other learning tasks? Yes \_\_\_ NO \_\_\_  
If yes, what other learning tasks?

How often? 1) seldom \_\_\_ 2) sometimes \_\_\_ 3) often \_\_\_ 4) very  
often \_\_\_

f) Additional Comments:

II. a) Describe one method or "mental trick" you would use to remember the word list on either Activity One or Activity Two.

b) How did you learn to use this kind of method?  
taught by 1) self \_\_\_ 2) teacher \_\_\_ 3) friends \_\_\_ 4) parents \_\_\_  
5) other (specify) \_\_\_\_\_

c) How old were you when you first learned to use this method?  
1) pre-school \_\_\_ 2) elementary school \_\_\_ 3) junior high \_\_\_  
4) high school \_\_\_ 5) since high school \_\_\_

d) What does this method do to help you learn?

e) Do you use this method for other learning tasks? Yes \_\_\_ No \_\_\_  
If yes, what other learning tasks?

How often? 1) seldom \_\_\_ 2) sometimes \_\_\_ 3) often \_\_\_ 4) very  
often \_\_\_

f) Additional Comments :

III. a) Describe one method or "mental trick" you would use to remember  
the word list on either Activity One or Activity Two.

b) How did you learn to use this kind of method?  
taught by 1) self \_\_\_ 2) teacher \_\_\_ 3) friends \_\_\_ 4) parents \_\_\_  
5) other (specify) \_\_\_\_\_

c) How old were you when you first learned to use this method?  
1) pre-school \_\_\_ 2) elementary school \_\_\_ 3) junior high \_\_\_  
4) high school \_\_\_ 5) since high school \_\_\_

d) What does this method do to help you learn?

e) Do you use this method for other learning tasks? Yes \_\_\_ No \_\_\_  
If yes, what other learning tasks?

How often? 1) seldom \_\_\_ 2) sometimes \_\_\_ 3) often \_\_\_ 4) very  
often \_\_\_

f) Additional Comments:

IV. a) Describe one method or "mental trick" you would use to remember  
the word list on either Activity One or Activity Two.

b) How did you learn to use this kind of method?  
taught by 1) self \_\_\_ 2) teacher \_\_\_ 3) friends \_\_\_ 4) parents \_\_\_  
5) other (specify) \_\_\_\_\_

c) How old were you when you first learned to use this method?  
1) pre-school \_\_\_ 2) elementary school \_\_\_ 3) junior high \_\_\_  
4) high school \_\_\_ 5) since high school \_\_\_

d) What does this method do to help you learn?

e) Do you use this method for other learning tasks? Yes \_\_\_ No \_\_\_  
If yes, what other learning tasks?

How often? 1) seldom \_\_\_ 2) sometimes \_\_\_ 3) often \_\_\_ 4) very  
often \_\_\_

f) Additional Comments:

WHICH OF THE METHODS YOU JUST DESCRIBED DO YOU FEEL IS THE MOST IMPORTANT  
TO YOU OR "BEST"? WHY?



DIRECTIONS FOR LEARNING ACTIVITIES THREE, FOUR, AND FIVE:

TAKE THE HANDOUT WITH THE TITLE "SEVEN LEARNING ACTIVITIES" AND LOOK AT THE PAGE WHICH HAS LEARNING ACTIVITIES THREE, FOUR, AND FIVE ON IT. LEARNING ACTIVITIES THREE, FOUR, AND FIVE ARE ALL LISTS CONTAINING PAIRS OF WORDS. TRY TO THINK OF HAVING TO LEARN EACH PAIR SO THAT YOU COULD REMEMBER THE SECOND WORD OF EACH PAIR IF THE FIRST WORD OF THE PAIR WAS GIVEN TO YOU.

FOR EXAMPLE: If you were given this list to learn:

window - lion

July 4, 1776 - Declaration of Independence signed

chair - girl

and later were given:

July 4, 1776 -

chair -

window -

you could remember and write down:

Declaration of Independence signed

girl

lion

After you have looked at Learning Activities Three, Four, and Five, we want you to tell us how you would learn them. Tell us the ways, methods, or "mental tricks" you would use on any or all three of the activities to help yourself learn. Tell us about as many ways as you can think of. The following three pages provide spaces for your answers about Activities Three, Four, and Five. Describe two methods on each page or if you need more

paper, just write on the back of these pages. You do not have to have four methods but try to tell us as many of your methods as you can.

I. a) Describe one method or "mental trick" you would use to learn the words in any one or all three of the activities.

b) How did you learn to use this kind of method?  
taught by 1) self \_\_\_ 2) teacher \_\_\_ 3) friends \_\_\_ 4) parents \_\_\_  
5) other (specify) \_\_\_\_\_

c) How old were you when you first learned to use this method?  
1) pre-school \_\_\_ 2) elementary school \_\_\_ 3) junior high \_\_\_  
4) high school \_\_\_ 5) since high school \_\_\_

d) What does this method do to help you learn?

e) Do you use this method for other learning tasks? Yes \_\_\_ No \_\_\_  
If yes, what other learning tasks?

How often? 1) seldom \_\_\_ 2) sometimes \_\_\_ 3) often \_\_\_ 4) very  
often \_\_\_

f) Additional Comments:

II. a) Describe one method or "mental trick" you would use to learn the words in any one or all three of the activities.

b) How did you learn to use this kind of method?  
taught by 1) self \_\_\_ 2) teacher \_\_\_ 3) friends \_\_\_ 4) parents \_\_\_  
5) other (specify) \_\_\_\_\_

c) How old were you when you first learned to use this method?  
1) pre-school \_\_\_ 2) elementary school \_\_\_ 3) junior high \_\_\_  
4) high school \_\_\_ 5) since high school \_\_\_

d) What does this method do to help you learn?

e) Do you use this method for other learning tasks? Yes \_\_\_ No \_\_\_  
If yes, what other learning tasks?

How often? 1) seldom \_\_\_ 2) sometimes \_\_\_ 3) often \_\_\_ 4) very  
often \_\_\_

f) Additional Comments:

III. a) Describe one method or "mental trick" you would use to learn the  
words in any one or all three of the activities.

b) How did you learn to use this kind of method?  
taught by 1) self \_\_\_ 2) teacher \_\_\_ 3) friends \_\_\_ 4) parents \_\_\_  
5) other (specify) \_\_\_\_\_

c) How old were you when you first learned to use this method?  
1) pre-school \_\_\_ 2) elementary school \_\_\_ 3) junior high \_\_\_  
4) high school \_\_\_ 5) since high school \_\_\_\_\_

d) What does this method do to help you learn?

e) Do you use this method for other learning tasks? Yes \_\_\_ No \_\_\_  
If yes, what other learning tasks?

How often? 1) seldom \_\_\_ 2) sometimes \_\_\_ 3) often \_\_\_ 4) very  
often \_\_\_

f) Additional Comments:

IV. a) Describe one method or "mental trick" you would use to learn the  
words in any one or all three of the activities.

b) How did you learn to use this kind of method?  
taught by 1) self \_\_\_ 2) teacher \_\_\_ 3) friends \_\_\_ 4) parents \_\_\_  
5) other (specify) \_\_\_\_\_

- c) How old were you when you first learned to use this method?  
1) pre-school \_\_\_ 2) elementary school \_\_\_ 3) junior high \_\_\_  
4) high school \_\_\_ 5) since high school \_\_\_
- d) What does this method do to help you learn?
- e) Do you use this method for other learning tasks? Yes \_\_\_ No \_\_\_  
If yes, what other learning tasks?
- How often? 1) seldom \_\_\_ 2) sometimes \_\_\_ 3) often \_\_\_ 4) very  
often \_\_\_
- f) Additional Comments:

WHICH OF THE METHODS YOU JUST DESCRIBED DO YOU FEEL IS THE MOST IMPORTANT  
TO YOU OR "BEST"? WHY?

**DIRECTIONS FOR LEARNING ACTIVITIES SIX AND SEVEN:**

LOOK AT THE THREE PAGES THAT HAVE LEARNING ACTIVITIES SIX AND SEVEN ON THEM. TRY TO THINK OF LEARNING THE READINGS SO THAT YOU CAN REMEMBER AND UNDERSTAND THEM WELL ENOUGH TO FULLY EXPLAIN WHAT IS IN THEM TO SOMEONE ELSE, WITHOUT LOOKING AT THE ORIGINAL READINGS.

After you have looked at Learning Activities Six and Seven, we want you to tell us how you would learn them. Tell us the ways, methods, or "mental tricks" you would use on any one or both of the activities to help yourself remember and understand the readings. Tell us about as many ways as you can think of. The following three pages provide spaces for your answers about Activities Six and Seven. Describe two methods on each page or if you need more paper, just write on the back of these pages. You do not have to have four or more methods, but try to tell us as many of your methods as you can.

I. a) Describe one method or "mental trick" you would use to help you remember and understand the readings in either Activity Six or Activity Seven.

b) How did you learn to use this kind of method?  
taught by 1) self \_\_\_ 2) teacher \_\_\_ 3) friends \_\_\_ 4) parents \_\_\_  
5) other (specify) \_\_\_\_\_

c) How old were you when you first learned to use this method?  
1) pre-school \_\_\_ 2) elementary school \_\_\_ 3) junior high \_\_\_  
4) high school \_\_\_ 5) since high school \_\_\_

d) What does this method do to help you learn?

e) Do you use this method for other learning tasks? Yes \_\_\_ No \_\_\_  
If yes, what other learning tasks?

How often? 1) seldom \_\_\_ 2) sometimes \_\_\_ 3) often \_\_\_ 4) very  
often \_\_\_

f) Additional Comments:

II. a) Describe one method or "mental trick" you would use to help you remember and understand the readings in either Activity Six or Activity Seven.

b) How did you learn to use this kind of method?  
taught by 1) self \_\_\_ 2) teacher \_\_\_ 3) friends \_\_\_ 4) parents \_\_\_  
5) other (specify) \_\_\_\_\_

c) How old were you when you first learned to use this method?  
1) pre-school \_\_\_ 2) elementary school \_\_\_ 3) junior high \_\_\_  
4) high school \_\_\_ 5) since high school \_\_\_

d) What does this method do to help you learn?

e) Do you use this method for other learning tasks? Yes \_\_\_ No \_\_\_  
If yes, what other learning tasks?

How often? 1) seldom \_\_\_ 2) sometimes \_\_\_ 3) often \_\_\_ 4) very  
often \_\_\_

f) Additional Comments:

III. a) Describe one method or "mental trick" you would use to help  
you remember and understand the readings in either Activity Six  
or Activity Seven.

b) How did you learn to use this kind of method?  
taught by 1) self \_\_\_ 2) teacher \_\_\_ 3) friends \_\_\_ 4) parents \_\_\_  
5) other (specify) \_\_\_\_\_

c) How old were you when you first learned to use this method?  
1) pre-school \_\_\_ 2) elementary school \_\_\_ 3) junior high \_\_\_  
4) high school \_\_\_ 5) since high school \_\_\_

d) What does this method do to help you learn?

e) Do you use this method for other learning tasks? Yes \_\_\_ No \_\_\_  
If yes, what other learning tasks?

How often? 1) seldom \_\_\_ 2) sometimes \_\_\_ 3) often \_\_\_ 4) very  
often \_\_\_

f) Additional Comments:

IV. a) Describe one method or "mental trick" you would use to help  
you remember and understand the readings in either Activity Six  
or Activity Seven.

b) How did you learn to use this kind of method?  
taught by 1) self \_\_\_ 2) teacher \_\_\_ 3) friends \_\_\_ 4) parents \_\_\_  
5) other (specify) \_\_\_\_\_

c) How old were you when you first learned to use this method?  
1) pre-school \_\_\_\_ 2) elementary school \_\_\_\_ 3) junior high \_\_\_\_  
4) high school \_\_\_\_ 5) since high school \_\_\_\_

d) What does this method do to help you learn?

e) Do you use this method for other learning tasks? Yes \_\_\_\_ No \_\_\_\_  
If yes, what other learning tasks?

How often? 1) seldom \_\_\_\_ 2) sometimes \_\_\_\_ 3) often \_\_\_\_ 4) very  
often \_\_\_\_

f) Additional Comments:

WHICH OF THE METHODS YOU JUST DESCRIBED DO YOU FEEL IS MOST IMPORTANT TO  
YOU OR "BEST"? WHY?



## PART II

IN THIS PART OF THE QUESTIONNAIRE WE WILL BE ASKING YOU TO LOOK AT ALL SEVEN LEARNING ACTIVITIES AGAIN. THIS TIME WE WILL GIVE YOU SEVERAL LISTS OF LEARNING METHODS. DECIDE WHICH OF THESE METHODS YOU HAVE USED IN THE PAST TO HELP YOU LEARN TASKS LIKE THESE. PUT A CHECK BESIDE THESE METHODS.

REMEMBER: THERE ARE NO "RIGHT" OR "WRONG" ANSWERS, AND THE BEST METHODS ARE THE ONES WHICH WORK BEST FOR YOU!

WE REALLY WANT TO KNOW YOUR METHODS!!!

## DIRECTIONS FOR LEARNING ACTIVITIES ONE AND TWO

LOOK AGAIN AT THE PAGE THAT HAS LEARNING ACTIVITIES ONE AND TWO ON IT. SAY YOU HAD TO LEARN EACH OF THE LISTS SO THAT YOU COULD LATER WRITE DOWN THE WORDS IN ANY ORDER WITHOUT SEEING THE ORIGINAL LIST.

FOR EXAMPLE: If you were given this list to learn: window

lion

chair

girl

and the list was then taken away from you, you would have to be able to write down all the words on it from your memory, in any order.

FOR EXAMPLE: lion

girl

chair

window

After you have looked at Learning Activities One and Two, we want you to look at the list of Learning Methods on the next three pages. You will see 8 general learning method titles with some examples under each one. Put a check mark by the examples of methods you would use to learn these activities. Check as many or as few as YOU use.

Remember, there are no "RIGHT" OR "WRONG" ANSWERS. Everyone learns in different ways. Check the methods you use, that is what we are interested in learning.

General Learning Methods and Examples  
for Activities One and Two

NOTE: PLEASE READ THE LIST CAREFULLY

Method 1. Practicing or Production

- \_\_\_\_\_ A. Read the material over several times.
- \_\_\_\_\_ B. Write the lists on another piece of paper.
- \_\_\_\_\_ C. Test yourself on the material.
- \_\_\_\_\_ D. Draw pictures or cartoons relating to the material.
- \_\_\_\_\_ E. Learn the words in groups.

Method 2. Physical Word Similarities and Differences

- \_\_\_\_\_ A. Common pattern in spelling. For example, two words have a double letter.
- \_\_\_\_\_ B. Similar letters.
- \_\_\_\_\_ C. Similar sounds.
- \_\_\_\_\_ D. Distinctive spellings or pronunciations of one or more words.
- \_\_\_\_\_ E. Comparing or contrasting the number of syllables or letters.

Method 3. Selecting a Part of the Words.

- \_\_\_\_\_ A. Using abbreviations of the words.
- \_\_\_\_\_ B. Using parts of each word to make a new word.
- \_\_\_\_\_ C. Using only the first letter to remember the word.
- \_\_\_\_\_ D. Acronyms - using the first letter of 2 or more words to make a new word or phrase.
- \_\_\_\_\_ E. Alphabetize the words.

## LEARNING ACTIVITIES ONE AND TWO CONTINUED.

### Method 4. Using "Pictures" in your Mind or Mental Images

- \_\_\_\_\_ A. Picture an example or image of the word in your mind.
- \_\_\_\_\_ B. Picture an example or image of more than one word at a time.
- \_\_\_\_\_ C. Create a picture of the relationships between the words.
- \_\_\_\_\_ D. Think about your emotional reactions to your images.
- \_\_\_\_\_ E. Place the words in "locations" along a path of your activities.
- \_\_\_\_\_ F. Picture the words and "hear" yourself saying them.

### Method 5. Meaningful Elaboration of the Material.

NOTE: Please try to think of an example of how you would use this method. If you can't, it's OK. Check the Method anyway.

- \_\_\_\_\_ A. Relate the words to your experience or your own characteristics.  
Example:
- \_\_\_\_\_ B. Relate the words to your beliefs or attitudes.  
Example:
- \_\_\_\_\_ C. Relate them to what you already know.  
Example:
- \_\_\_\_\_ D. Try to find logical relations between the words.  
Example:
- \_\_\_\_\_ E. Imagine a situation or event that relates the words to one another.  
Example:
- \_\_\_\_\_ F. Think of the implications or effects, of pairing the words.  
Example:
- \_\_\_\_\_ G. Use symbolic or literary associations for the words.  
Example:

## LEARNING ACTIVITIES ONE AND TWO CONTINUED.

### Method 6. Find Meaningful Similarities and Differences

- \_\_\_\_\_ A. Place the words in the same category or note that they belong in contrasting or related categories.
- \_\_\_\_\_ B. Find one word or make up a word that will connect, or associate, two or more words together.
- \_\_\_\_\_ C. Think about the similarities and differences between the meanings of the words.

### Method 7. Make Up Phrases or Sentences

- \_\_\_\_\_ A. Make up a sentence or phrase using as many words as possible.
- \_\_\_\_\_ B. Make up a sentence or phrase relating as many words as possible.
- \_\_\_\_\_ C. Make up phrases or sentences using words whose first letter is the same as the words on the list.
- \_\_\_\_\_ D. Make up a rhyme using the words.
- \_\_\_\_\_ E. Make up a paragraph or a story using words from the list.

### Method 8. Categorize or Group the Words on the List

- \_\_\_\_\_ A. Pick out happy and sad words or positive and negative words.
- \_\_\_\_\_ B. Divide the words by type, class, or category such as animal, vegetable, or mineral, type of material they are made from, and so on.
- \_\_\_\_\_ C. Divide the words by the uses they have.
- \_\_\_\_\_ D. Pick out the easy and hard words.

OTHER: Please write down any other methods or comments you have. Also write down any combinations you make of two or more methods. (Feel free to use the back of this page if you need more room.)

DIRECTIONS FOR LEARNING ACTIVITIES THREE, FOUR, AND FIVE:

TAKE THE HANDOUT WITH THE TITLE "SEVEN LEARNING ACTIVITIES" AND LOOK AGAIN AT THE PAGE WHICH HAS LEARNING ACTIVITIES THREE, FOUR, AND FIVE ON IT. TRY TO THINK OF HAVING TO LEARN EACH LIST SO THAT IF THE LEFT-HAND ITEM ON EACH PAIR WAS GIVEN TO YOU, YOU COULD REMEMBER AND WRITE DOWN THE RIGHT-HAND ITEM.

FOR EXAMPLE: If you were given this list to learn:

window - lion

July 4, 1776 - Declaration of Independence signed

chair - girl

and later were given:

July 4, 1776 -

chair -

window -

you could remember and write down:

Declaration of Independence signed

girl

lion

After you have looked at Learning Activities Three, Four, and Five, we want you to look at the list of Learning Methods on the next three pages. You will see 8 general learning method titles with some examples under each one of them. Put a check mark by the examples of methods you would use to learn these activities. Check as many or as few as YOU use. Remember, there are no "RIGHT" OR "WRONG" ANSWERS! Everyone learns in different ways. Check the methods you use, that is what we are interested in learning.

General Learning Methods and Examples  
for Activities Three, Four and Five

**NOTE: PLEASE CHECK THE EXAMPLES OF METHODS YOU WOULD USE TO LEARN  
ACTIVITIES THREE, FOUR AND FIVE.**

**Method 1. Practicing or Production**

- \_\_\_\_\_ A. Read the material over several times.
- \_\_\_\_\_ B. Write the lists on another piece of paper.
- \_\_\_\_\_ C. Test yourself on the material.
- \_\_\_\_\_ D. Draw pictures or cartoons relating to the material.
- \_\_\_\_\_ E. Learn the words in groups.

**Method 2. Physical Word Similarities and Differences.**

- \_\_\_\_\_ A. Common patterns in spelling. For example, two words have a double letter.
- \_\_\_\_\_ B. Similar letters.
- \_\_\_\_\_ C. Similar sounds.
- \_\_\_\_\_ D. Both have distinctive spellings or pronunciations.
- \_\_\_\_\_ E. Comparing or contrasting the number of syllables or letters.

**Method 3. Selecting a Part of the Words.**

- \_\_\_\_\_ A. Using abbreviations of the words.
- \_\_\_\_\_ B. Using parts of each word to make a new word.
- \_\_\_\_\_ C. Using only the first letter to remember the word.
- \_\_\_\_\_ D. Acronyms - using the first letter of 2 or more words to make a new word or phrase.
- \_\_\_\_\_ E. Alphabetize the words.

**Method 4. Using "Pictures" in your Mind or Mental Imagery.**

- \_\_\_\_\_ A. Picture images or examples of both items in your mind side by side.
- \_\_\_\_\_ B. Picture images or examples of both items doing something together.

- \_\_\_\_\_ C. Picture images or examples of both items separately.
- \_\_\_\_\_ D. Picture the actual printed word.
- \_\_\_\_\_ E. Picture the words and "hear" yourself saying them.



### LEARNING ACTIVITIES THREE, FOUR AND FIVE CONTINUED.

#### Method 5. Meaningful Elaboration of the Material.

NOTE: Please try to think of an example of how you would use this method. If you can't, it's OK. Check the Method anyway.

- \_\_\_\_\_ A. Relate the words to your experience or your own attitudes.

Example:

- \_\_\_\_\_ B. Relate the words to your beliefs or attitudes.

Example:

- \_\_\_\_\_ C. Relate them to what you already know.

Example:

- \_\_\_\_\_ D. Try to find logical relations between the items.

Example:

- \_\_\_\_\_ E. Imagine or picture a situation or event that relates the items to one another.

Example:

- \_\_\_\_\_ F. Think of the implications, or effects, of pairing the items.

Example:

- \_\_\_\_\_ G. Use symbolic or literary associations for the items.

Example:

#### Method 6. Find Meaningful Similarities and Differences.

- \_\_\_\_\_ A. Think about the similarities and differences between the meanings of the words.

- \_\_\_\_\_ B. Find a word or make up a word that will connect, or associate, the two items in a pair.

#### Method 7. Make up Phrases or Sentences

- \_\_\_\_\_ A. Make up a phrase or sentence using both members of a pair.

- \_\_\_\_\_ B. Make up a phrase or sentence relating both members of a pair.

- \_\_\_\_\_ C. Make up phrases or sentences using words whose first letter

### LEARNING ACTIVITIES THREE, FOUR AND FIVE CONTINUED.

is the same as the words on the list.

- \_\_\_\_\_ D. Make up a rhyme using the words.
- \_\_\_\_\_ E. Make up a paragraph or a story using word pairs from the list.

#### Method 8. Categorize or Group the Words on the List.

- \_\_\_\_\_ A. Pick out happy and sad words or positive and negative words.
- \_\_\_\_\_ B. Divide the words by type, class or category, such as animal, vegetable, or mineral; type of material they are made from and so on.
- \_\_\_\_\_ C. Divide the words by the uses they have.
- \_\_\_\_\_ D. Pick out the easy and hard words.

Other: Please write down any other methods or comments you have. Also write down any combinations you make of two or more methods.  
(Feel free to use the back of this page if you need more room.)

**DIRECTIONS FOR LEARNING ACTIVITIES SIX AND SEVEN:**

**LOOK AGAIN AT THE PAGES WHICH HAVE LEARNING ACTIVITIES SIX AND SEVEN ON THEM. TRY TO THINK OF LEARNING THE READING SO THAT YOU CAN REMEMBER AND UNDERSTAND THEM WELL ENOUGH TO EXPLAIN WHAT IS IN THEM TO SOMEONE ELSE, WITHOUT LOOKING AT THE ORIGINAL READINGS.**

After you have looked at Learning Activities Six and Seven, we want you to look at the list of learning methods on the next three pages. You will see 5 general learning method titles with some examples under each of them. Put a check mark by the examples of methods you would use to learn these activities. Check as many or as few as YOU use. Remember, there are no "RIGHT" OR "WRONG" ANSWERS! Everyone learns in different ways. Check the methods you use, that is what we are interested in knowing.

General Learning Methods and Examples  
For Activities Six and Seven

**NOTE:** CHECK ANY EXAMPLES OF METHODS YOU WOULD USE TO LEARN THESE MATERIALS.  
PLEASE READ THE LIST CAREFULLY BECAUSE SOME OF THE METHODS AND THE  
EXAMPLES ARE DIFFERENT FROM THE ONES YOU SAW FOR THE OTHER ACTIVITIES.

**Method 1. Using Study Skills, Practice or Production**

- \_\_\_\_\_ A. Read the material over several times.
- \_\_\_\_\_ B. Underline key ideas or words.
- \_\_\_\_\_ C. Take notes.
- \_\_\_\_\_ D. Summarize the material.
- \_\_\_\_\_ E. Summarize by paragraph or section.
- \_\_\_\_\_ F. List major words or ideas.
- \_\_\_\_\_ G. Rewrite it.
- \_\_\_\_\_ H. Paraphrase, that is, write the information and ideas in your own words.
- \_\_\_\_\_ I. Review to check your understanding.
- \_\_\_\_\_ J. Ask yourself questions.
- \_\_\_\_\_ K. Draw pictures or cartoons relating to the material.
- \_\_\_\_\_ L. Create an outline.

**Method 2. Selecting Parts of the Reading**

- \_\_\_\_\_ A. Select out the main ideas.
- \_\_\_\_\_ B. Select out the key words or terms.
- \_\_\_\_\_ C. Select out the action phrases.
- \_\_\_\_\_ D. Select out the characters.

**Method 3. Using "Pictures" in your Mind or Mental Images**

- \_\_\_\_\_ A. Picture the main ideas or information.
- \_\_\_\_\_ B. Picture examples.
- \_\_\_\_\_ C. Picture a story.

## LEARNING ACTIVITIES SIX AND SEVEN CONTINUED.

\_\_\_\_\_ D. "See" and "hear" the events in your mind.

### Method 4. Meaningful Elaboration of the Material.

NOTE: Please try to think of an example of how you would use this method. If you can't, it's OK. Check the Method anyway.

\_\_\_\_\_ A. Think about the purpose or need for the material.

Example:

\_\_\_\_\_ B. Relate it to your experience or characteristics.

Example:

\_\_\_\_\_ C. Relate it to your beliefs or attitudes.

Example:

\_\_\_\_\_ D. Think about your emotional reactions to the content.

Example:

\_\_\_\_\_ E. Relate it to people in general.

Example:

\_\_\_\_\_ F. Think about the ideas that you have as you read it.

Example:

\_\_\_\_\_ G. Think about other people's reactions to the content or ideas.

Example:

\_\_\_\_\_ H. Relate it to what you already know.

Example:

\_\_\_\_\_ I. "Free associate" to the topic or ideas, that is, just think about the topic or ideas and see what comes to your mind.

Example:

\_\_\_\_\_ J. Think about the implications, or effect, of what the material is saying.

Example:

\_\_\_\_\_ K. Look for common sense or logical relationships in the material.

Example:

- \_\_\_\_\_ L. Relate the content to the theme.

Example:

- \_\_\_\_\_ M. Relate key words or concepts to ideas.

Example:

- \_\_\_\_\_ N. Discussion with other people.

Example:

OTHER: Please write down any other methods or comments you have. Also write down any combinations you make of two or more methods.  
(Feel free to use the back of this page if you need more room.)

## PART III

### DIRECTIONS FOR PART III

WE WOULD NOW LIKE SOME EXTRA INFORMATION ABOUT OTHER METHODS OR "MENTAL TRICKS" YOU USE TO HELP YOURSELF LEARN.

WHAT KINDS OF METHODS DO YOU USE FOR YOUR EVERYDAY LEARNING NEEDS?

HOW DO YOU REMEMBER OR LEARN MATERIALS IN:

- TEXTS
- NOVELS
- NEWSPAPERS AND MAGAZINES
- WORK MATERIALS
- OTHER ACTIVITIES

THE FOLLOWING PAGE PROVIDES SPACES FOR YOUR ANSWERS. IF YOU NEED MORE PAPER JUST WRITE ON THE BACK OF THE PAGE.

REMEMBER: DESCRIBE ONLY NEW METHODS, NOT ONES YOU HAVE ALREADY TOLD US ABOUT.

I. a) Describe one method or "mental trick" you would use.

b) How did you learn to use this kind of method?  
taught by 1) self \_\_\_ 2) teacher \_\_\_ 3) friends \_\_\_ 4) parents \_\_\_  
5) other (specify) \_\_\_\_\_

c) How old were you when you first learned to use this method?  
1) pre-school \_\_\_ 2) elementary school \_\_\_ 3) junior high \_\_\_  
4) high school \_\_\_ 5) since high school \_\_\_

d) What does this method do to help you learn?

e) Do you use this method for other learning tasks? Yes \_\_\_ No \_\_\_  
If yes, what other learning tasks?

How often? 1) seldom \_\_\_ 2) sometimes \_\_\_ 3) often \_\_\_ 4) very  
often \_\_\_

f) Additional Comments:

II. a) Describe one method or "mental trick" you would use.

b) How did you learn to use this kind of method?  
taught by 1) self \_\_\_ 2) teacher \_\_\_ 3) friends \_\_\_ 4) parents \_\_\_  
5) other (specify) \_\_\_\_\_

c) How old were you when you first learned to use this method?  
1) pre-school \_\_\_ 2) elementary school \_\_\_ 3) junior high \_\_\_  
4) high school \_\_\_ 5) since high school \_\_\_

d) What does this method do to help you learn?

e) Do you use this method for other learning tasks? Yes \_\_\_ No \_\_\_  
If yes, what other learning tasks?



How often? 1) seldom \_\_\_\_ 2) sometimes \_\_\_\_ 3) often \_\_\_\_ 4) very  
often \_\_\_\_

f) Additional Comments:

## PART IV

### PART IV - BASIC INFORMATION

PLEASE CHECK THE APPROPRIATE ANSWERS

1. Sex     ☐ 1 Male     ☐ 2 Female
2. Age in years
3. Ethnicity  
☐ 1 Afro-American  
☐ 2 Euro-American (Caucasian)  
☐ 3 American Indian  
☐ 4 Mexican-American  
☐ 5 Other (Please be specific)
4. Highest school grade level reached (circle one)  

Grade school	High School	College	Graduate
1 2 3 4 5 6 7 8	9 10 11 12	13 14 15 16	17 18 19 20 21
5. If you did not finish high school, have you gotten a G.E.D.?  
☐ 1 Yes     ☐ 2 No
6. If you had the opportunity, would you like to learn more about these kinds of learning methods or processes?  
☐ 1 Yes     ☐ 2 No     ☐ 3 Uncertain

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INTEL R AND D CENTER /  
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SPACE MEDICAL RSCH LAB AIRBORNE RANGER RESEARCH  
CH AND TECHNOLOGY LAB AITN: DAVID-AS (DR. R. S. DUNN)  
AN ENGINEERING BRANCH  
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